

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. - 98. (cancelled)

99. (new) A method of manufacturing substrates with a vacuum plasma treated surface comprising the steps of

- providing a target with a target surface being circular about an axis;
- providing at least one substrate distant from and opposite said target surface having a substrate surface;
- generating in the volume between said target surface and said substrate surface a magnetic field pattern of
 - a) a magnetron field pattern forming, considered in direction towards said target surface:

a substantially circular closed loop eccentrically with respect to said axis and along said target surface, said substantially circular closed loop having a radius like extension towards a center area of said substantially circular closed loop and considered parallel to said target surface, tunnel-like arcing from an outer area of first magnetic pole to an inner area of second magnetic pole, whereby said inner area is confined with respect to said outer area by a locus of zero component of magnetic field perpendicular to said target surface, said

locus being substantially circular and closed loop about said center area and having a respective radius like extension towards said center area,

b) an unbalanced long-range field pattern which is asymmetrical generated by an additional magnetic flux along a distinct area of said outer area relative to magnetic flux along said inner area and relative to the remainder of said outer area; said distinct area extending along the periphery of said target surface thereby sickle-like increasing said outer area; said long range field pattern reaching the substrate surface having a component of magnetic field parallel to said substrate of at least 0.1 Gauss,

- generating a plasma discharge in said magnetic field pattern;
- plasma treating said substrate surface, thereby
- sweeping said magnetic field pattern along said target surface, by rotational movement about said axis.

100. (new) The method of claim 99, wherein said component of magnetic field parallel to said substrate surface is selected to be between 1 G and 20G.

101. (new) The method of claim 99, further comprising covering with said tunnel-like magnetron field pattern more than 60% of said target surface.

102. (new) The method of claim 99, thereby covering with said tunnel-like magnetron field pattern more than 85% of said target surface.

103. (new) The method of claim 99, further comprising adjusting uniformity of ion current density at said substrate surface by adjusting said flux along said distinct area.

104. (new) The method of claim 99, further comprising providing more than one substrate.

105. (new) The method of claim 104, further comprising the step of selecting said more than one substrate to be arranged within a circular area, sweeping said unbalanced field pattern around a center axis of said circular area.

106. (new) The method of claim 99, further comprising the step of selecting said substrate to be circular, sweeping said unbalanced field pattern around a center axis of said substrate.

107. (new) A magnetron source comprising

- a target with a target surface and an opposite surface circular about an axis;
- a magnet arrangement adjacent said opposite surface and having:
 - a first magnet subarrangement;
 - a second magnet subarrangement;
 - said first magnet subarrangement having a first area pointing towards said opposite surface and of one magnetic polarity;

- said second magnet subarrangement having a second area pointing towards said opposite surface and of the other magnetic polarity;
- said first area forming a substantially circular loop along said opposite surface, eccentrically with respect to said axis and having a radius like extension towards a center of said loop;
- said second area forming a closed loop inside, along and distant from said first area;
- said first area generating a first magnetic flux through said target surface;
- said second area generating a second magnetic flux through said target surface;
- comprising a third magnet sub-arrangement opposite said opposite surface generating a third magnetic flux superimposed to said first magnetic flux through said target surface, thereby resulting in a resultant magnetic flux along a distinct area which is larger than said first magnetic flux along the remainder of said first area, thereby generating an unbalanced, asymmetric, long-range magnetic field, said distinct area sickle-like increasing the extent of said first area;
- a sweeping arrangement rotationally moving said first to third magnet sub-arrangements about said axis.

108. (new) A magnetron treatment chamber comprising a magnetron source as claimed in claim 107 and a substrate carrier remote from and opposite to the target surface of said magnetron source.

109. (new) The chamber of claim 108, further comprising an anode arrangement adjacent said substrate carrier.

110. (new) The chamber of claim 109, further comprising a shield confining a process area between said source and said substrate carrier and being electrically floating or on an anodic potential.

111. (new) The chamber of claim 109, wherein said anode is hidden behind a shield arrangement and with respect to processing volume.

112. (new) The chamber of claim 108, further comprising at least one coil with a coil axis perpendicular to the target surface of said source.

113. (new) The chamber of claim 108, wherein said substrate carrier is electrically floating or connectable to a predetermined biasing potential.